D. ...OLSON

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LATE BLIGHT AND ROT OF POTATOES IN 1926

Considerable Loss After Harvest Reported

R. J. Haskell, Plant Disease Survey, U. S. D. A., Washington, D. C.

Phytophthora infestans, the source of blight and rot of potatoes, has caused heavy loss to the late crop this year. Favored by a rainy fall, the disease attacked tops and tubers late in the season, and before growers realized it bumper crops had been cut to small and unprofitable ones. The wet and in some cases snowy weather delayed digging and in many places potatoes were dug and in some instances stored in a wet condition. Furthermore, the eastern part of the United States experienced a late fall with the result that many potatoes were dug before the tops were killed by frost and while still immature. The situation was furthur complicated in the Great Lake States by an early freeze with consequent injury to unharvested tubers. This resulted in some slimy soft rot in storage and on the market which was more or less confused with the late blight tuber rot. The result of these conditions has been the development of considerable rot in storage bins, transit, and market.

The greater portion of the main crop area, from New England and Pennsylvania westward to Wisconsin, was affected but the regions that were apparently the hardest hit were (1) an area comprising western New York, Pennsylvania, except for certain southeastern and southwestern counties, western Maryland, and northern Ohio; (2) northern Maine, including Aroostook County; (3) Wisconsin, especially Barron, Rusk, Lincoln, Taylor, and Chippewa Counties.

The Plant Disease Survey, of the Bureau of Plant Industry, has obtained data concerning late blight and rot of potatoes this year which may be of interest to readers of the American Potato Journal. The three principal sources of information on which this summary is based are (1) the collaborators of the Plant Disease

Survey, who are for the most part the plant pathologists at the Experiment Stations, (2) the reports of the U. S. Weather Bureau, and (3) reports of men engaged in the Inspection and Market News Services of the Fruit and Vegetable Division of the Bureau of Agricultural Economics.

Estimates of losses from blight and rot in some of the areas mentioned above have been made by collaborators of the Plant Disease Survey. The estimates are based on their own observations and on information obtained from other pathologists, county agents, growers, etc. In some instances the county agents have assisted considerably. According to these figures, New York sustained an estimated loss of 25 per cent, of which 20 per cent was in the field, and 5 per cent after harvest in storage or in transit. It is probable that Pennsylvania suffered similar losses but at the time of this writing the estimates have not been received. Maryland reported 4 per cent loss, of which 1 per cent occurred in storage. Ohio estimated 7 per cent loss with 2 per cent after harvest, and Wisconsin 15 per cent, of which 2 per cent was storage loss. When the losses for these states are expressed in bushels they total 14,183,000, which is about 4 per cent of the total potato production of the United States.

Maine Potatoes

The first report of late blight in the late potato area was received at Washington from Donald Folsom, Maine Experiment Station, who wrote that a trace of the disease had appeared in Aroostook County on August 5. On September 1, he and Reiner Bonde reported that on August 25, after a heavy rain and some warm weather, every plant in a one-acre plot was infected within a radius of 50 feet from two diseased plants which were the original source of infection. On October 15, Folsom stated that all plants were affected in certain untreated experimental plots in northern Maine with less than 10 per cent reduction in yield and about 1 per cent rot.

Early in November the Inspection and market News Service men of the Bureau of Agricultural Economics located in northern Maine did not observe any unusual amount of rot. Almost every year there is some rot at digging time and so the situation this season did not appear to be very different from the ordinary. However, after the stock had been in storage a few weeks, complaints began to be rather numerous and on November 19 one of the market representatives reported that according to his observations and those of shippers and others, considerable rot had developed in various potato houses all the way from Van Buren and Fort Kent down to Patton and Dover-Foxcroft. On December 16, shipping point inspectors at Presque Isle found decay ranging from none to 50 per cent in the potato houses and an estimate

was made that an average of 8 to 10 per cent of the Maine Potatoes in storage on December 1 were lost on account of rot.

Boston receives a great many potatoes from Maine and the marketing specialist located there and connected yith the inspection service reported on November 30 that about three-fourths of the cars from Maine were showing late blight in varying amounts. Most cars showed from 1 to 3 per cent, some 5 to 8 per cent, and still others as high as 15 per cent. The statement was made further that Canadian potatoes from New Brunswick andd Prince Edward Island were showing the disease in even larger amounts than the Maine stocks.

A large portion of Maine's crop is shipped to New York City and market inspectors there on December 3 stated that apparently there was more late blight tuber rot in Maine potatoes this year than usual.

One copy of the certificate prepared by marketing inspectors showing the condition of the carload as they find it, is filed in the Washington office of the Fruit and Vegetable Division of the Bureau of Agricultural Economics. Abstracts of the Certificates on file for Maine potatoes inspected between the dates of September 18 and October 26 were examined. These reports covered 67 cars inspected at Boston, Pittsburgh, New York, Trenton, Newark, Cleveland and Lawrence, Mass. In these cars there was an average of 5.05 per cent damage, of which 2.3 per cent was listed as late blight rot, 1.4 per cent as slimy soft rot, and 1.35 per cent as Fusarium tuber rot. The worst car was one inspected at Pittsburgh October 7 which showed from none to approximately 100 per cent late blight rot in various sacks with most of them containing from 25 to 50 per cent decayed potatoes. Another car showed 25 per cent late blight rot, six others from 10 to 15 per cent, and five had 5 per cent or less. Since much of the rot developed after harvest this year it is probable that an examination of certificates of inspection made in November and December would show a greater loss than that given above.

Potatoes from the New York, Pennsylvania Maryland and Ohio Area

In western New York late blight appeared during the latter part of August following a very rainy period. By October 1, the vines were killed rather generally over the western part of the state and by November 1 the situation had become so bad that the pathologists at the Experiment Station located at Ithaca estimated that about one-tenth of the crop of the state would be left in the field because of rot. In addition to this, another tenth of the crop failed to grow because the vines were killed by late blight, and at least one-twentieth of the crop was expected to rot in the growers' cellars or in transit or marketing.

In Pennsylvania, the extension plant pathologist for the state, wrote on October 20, that the first appearance of the disease noted was on August 18 in Lehigh County, that within three weeks of this date all unsprayed fields were almost completely dead east of the Blue Ridge, and that the outbreak occurred slightly later but with equal severity throughout the mountain portions of the state. The loss from rot was said to be the most severe on record, amounting from 25 to 150 bushels per acre. Properly sprayed fields showed increases in yield as high as 125 bushels per acre over the unsprayed.

In western Maryland late blight was very severe in unsprayed potato fields, according to the extension pathologist of that state. Rainy weather greatly hindered digging and a large portion of the harvesting was done under wet soil conditions. Some growers estimated from 25 to 30 per cent rot in the field.

Many fields in northern Ohio went down completely with late blight the first week in October and much rot occurred in the ground and in storage. The month of September was the wettest on record for that state. Ohio very often escapes epidemics of late blight but this year the disease was serious.

The marketing specialist located at Cleveland directing the inspection work for the Bureau of Agricultural Economics wrote that late blight rot was apparently occurring in nearly all of the producing sections furnishing Cleveland with potatoes, including Michigan, Ohio, New York, and Maine. He mentions inspecting cars from western New York where from 50 to 75 per cent of the stock was affected with late blight tuber rot. For the most part it was a dry rot and showed in all stages from early to advanced infection. On the Pittsburgh market it was commonly found in shipments not only from New York and Ohio but also from other states. In most instances it was not sufficiently abundant to affect the grade seriously, but mention is made of several cars from New York and one car from Ohio which showed very heavy percentages of decay up to 50 per cent.

Wisconsin Potatoes

It is probable that Wisconsin suffered losses exceeded only by New York, Pennsylvania, and possibly Maine. The first reports of the disease from that state were on August 17 when it was found on Rural New Yorker in Rusk County, and on August 21, when it was found on Green Mountain in Oneida County. At that time the disease was probably generally distributed in Wisconsin fields. Subsequent reports showed this to be true, and that it was spreading all over the state on October 1. The plant pathologists at the Wisconsin Experiment Station wrote that the losses would probably be more than for several years, and that extremely wet weather in August and September made spraying impossible, and that dealers were refusing to accept potatoes for storage when hauled

directly from the field on account of probable loss from rot. Questionnaires to county agents in the state resulted in an estimate of 15 per cent loss.

Market inspectors and pathologists at Chicago examined records on 43 Wisconsin cars of which 17 showed late blight rot. The decay ranged from 1 to 15 per cent and averaged 4.3 per cent. Inspectors visiting Wisconsin shipping points found some fields that were almost a total loss and made an estimate of approximately 10 per cent loss for the state.

Potatoes from other States

The New England States, exclusive of Maine, apparently did not suffer much loss from late blight except perhaps in some of the more northern parts of New Hampshire and Vermont. Weather conditions did not seem to be very favorable for the disease in southern New England. New Jersey apparently escaped entirely, and West Virginia for the most part did not suffer. In the latter state dry weather in the summer had caused early death of the vines and so, though fall weather was favorable for blight, the vines were already mostly dead. The important potato state of Michigan, which produced over 31,000,000 bushels last year, suffered some loss from this disease, but it does not appear to have been very generally distributed nor serious. The state losses were estimated as only a trace. Michigan potatoes arriving in the Chicago market seemed to be largely free from rot, although inspectors on Pittsburgh markets mentioned that decay occurred in Michigan cars.

In Minnesota the plant pathologists reported that the disease was not observed although the weather appeared to be favorable for its occurrence. On the Chicago market, however, 5 out of 32 cars Minnesota that were inspected showed an average of 5 per cent decay. It is probable, therefore, that there was some of the disease in Minnesota but it would appear that it was not prevalent nor serious enough to attract much attention.

The disease occurred in other states also, such as the mountain sections of North Carolina and on the Pacific coast. The first authentic report of the occurrence of this disease in Indiana was received this year.

NEW YORK'S 300-BUSHEL POTATO CLUB

E. V. Hardenburg

The 1926 yield results of New York's 300-bushel potato contest between its state institution farms are now a matter of record. This is the third year of this contest and the interest is increasing. The competition is under the direction of Charles Baldwin, Director of the Bureau of State Institution Farms, Department of

Farms and Markets, Albany, N. Y. It is designed to stimulate interest and increased efficiency in potato production in order that these institutions may become more self sustaining. The results have amply justified the effort. Certified seed of the highest quality and the most approved fertilizer and cultural practices are very generally used. In some cases, even land drainage and revision of the rotation have resulted.

In administering the contest, any single measured acre may be entered, a complete record of the methods used is submitted, and the final yield results are passed upon by the members of the Council of Farms and Markets. This year, 31 state institution farms entered the contest and the yields ranged from 120 to 528 bushels to the acre, the average yield being 270 bushels. Of the 31 contestants, 18 made between 200 and 300 bushels, 7 made between 300 and 400 bushels, and the winner, Clinton Prison Farm at Dannemora, made 528 bushels an acre. This is the second successive year that Clinton Prison Farm, far north and high up in the Adirondacks, has been returned the winner. Its success is due to two main factors, thoroughness of effort and an ideal climate and soil for the crop.

FAIR YIELDS OF POTATOES THIS SEASON

(Contribution from the Fruit and Vegetable Division, Bureau of Agricultural Economics, U. S. Department of Agriculture)

Average yield per acre of potatoes this season, as in other years, varied greatly in different parts of the country. Seed, soil, weather conditions, fertilizer, cultivation and other factors enter into the making of a potato crop, and variations in one or more of these factors result in differences of production. Maine with an average of 290 bushels per acre and Idaho with 178 bushels were the leading States this season. These two States also rank highest in averages for the 10-year period, having 225 bushels and 174 bushels respectively. The 10-year average for Utah and Nevada approximates 170 bushels, but this season they produced only about 142 bushels per acre. The exceptionally heavy yields in Maine make that the largest producing State. Maine's average per acre in 1924 was 315 bushels. Because of this predominance, the North Atlantic States as a group averaged more than 153 bushels per acre in 1926, Pennsylvania coming at the end of the group with 112 bushels.

Among the North Central States, Michigan was first with 120 bushels, while South Dakota's average of only 60 bushels per acre made that State last. The general average for this group was nearly 98. Six of the western States turned out more than 140 bushels per acre, so that the western region as a whole averaged 143. Idaho was first and Arizona brought up the end of the line

with only 55 bushels per acre, the lowest among all the States. Early potatoes throughout the South ranged from 60 bushels in Arkansas and Louisiana to 118 in Florida. Average for the South Atlantic group was about 95 and for the South Central group 73 bushels. The United States average of 113 bushels was about 11½ above the 10-year record and about 9 more than last season's (1925) outturn, but is 14 bushels less than was produced in 1924. European countries last season averaged about twice as many potatoes per acre as did the United States. Norway, Denmark and the Netherlands each exceeded 270 bushels. The Netherlands during 1922 secured high total of 340 bushels per acre.

The December crop report indicates 357,800,000 bushels of potatoes in 1926, compared with 323,000,000 in 1925 and 422,000,000 in 1924. The 19 surplus-producing late-potato States had a total of 253,228,000 bushels or nearly 20,000,000 more than in 1925. The difference amounts to some 33,000 carloads, of which 40 per cent usually are shipped to market. All the principal States had heavier crops except Pennsylvania, South Dakota, Nebraska, Colorado and Montana. On the basis of the July estimate of population—117,136,000 persons—the per capita production for the United States was slightly over 3 bushels. The increase of population by January 1 probably would reduce the per capita to less than 3 bushels.

Low temperatures and severe winter weather affected somewhat the haulings in country shipping districts and trading in city markets. However, weekly shipments have been running several hundred cars ahead of last season's corresponding record except during the week ended December 18, when movement fell short. Total output for the past month was about 1,000 cars heavier than the shipments of late 1925 and early 1926.

Following two weeks of rather light shipments and correspondingly light arrivals prices strengthened perceptibly just before New Year's Day. Exactly a year ago, prices also had reached highest point of the 1925-26 season to date. Then, the wholesale quotations in leading cities and in shipping sections averaged considerably above $4.00 per 100 pounds. Some markets approached close to $5.00 at the end of 1925, compared with the early 1927 average of about $3.00.

During the week ended January 8, prices sagged again. Most markets lost a good share of their recent advance, and shipping points closed about 10 cents below the preceding week's level. Western New York was an exception, however, as the price there held at $2.40-$2.50 per 100 pounds on sacked Round Whites. Bulk Green Mountains in northern Maine dropped quickly to $2.20 and then recovered by 10 cents. The North Central region reported a range of $2.00-$2.30, while the southern Idaho cash-track price on Russet Burbanks was $1.90. Part of the price decline may have been due to the fairly liberal supplies in many markets and the increasing shipments. Total movement of 4,370 cars was 1,000 more

than were shipped during the closing week of 1926. Most of the gain was in the North Central States and in Colorado and Nebraska. Movement from Canada was quite active, Boston alone receiving 60 cars of Canadian potatoes. Five cars of early stock started from Texas.

Pittsburgh quoted bushel hampers of Texas Bliss Triumphs, 1½ inch minimum diameter, at $4.00 and similar stock in sacks sold at $5.00 per 100 pounds on the Fort Worth market. Maine Green Mountains averaged slightly above $3.00 in eastern cities. The same variety from Long Island brought $3.40 bulk per 100 pounds in New York. Eastern sacked Round Whites ranged mostly $2.50-$3.00. Chicago carlot market quoted northern Round Whites lower at $2.25-$2.40 and Idaho Russets firm at $2.75-$3.00. Green Mountains from New Brunswick were being sacked locally in Boston and were selling at $2.85-$2.90 per 100 pounds, the same as arrivals from Maine. Highest price of the week was in Cleveland, where Idaho Russets touched $4.15. In general, the market position of potatoes was almost the same as a month ago or during early December.

Present outlook is for increased acreage of early potatoes in the South. First arrivals from the southern portion of Florida have been jobbing in the East at $8.50-$9.00 a barrel. The entire State of Florida expects 27,000 acres of potatoes this season, or 4,000 more than last year. Most of the increase probably will be in the Hastings district. Many of the early potatoes in the southern part of the State are of the Bliss Triumph variety. Reports from the lower Rio Grande Valley of Texas also indicate heavier planting than in 1926, so that the market supply of new potatoes may be relatively large.

MEMBERSHIP

New Members — **Secured by**

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PROGRESS

Everything either goes forward or backward. The Potato Association of America and the American Potato Journal are forging ahead and are now on the threshold of a new era in which more rapid progress will be made than ever before. We have now reached the stage where our momentum is ever-increasing and with a steady gain in power nothing will stop it.

The Association is better organized than ever before thru actions taken at the annual meeting held recently. At this meeting it was decided to appoint one person who has the authority to appoint assistants in each province or state to be responsible for the collection of dues and for new memberships in his or their territory. This is a big step for the welfare of the Association. Under this plan the Association is going to grow faster. It is well to remember **everybody can help.**

Other big changes are the elimination of advertisements in the Journal and the limiting it to approximately twelve pages. The organization committee suggested that short articles are desirable. It is hoped that our members who are **prolific writers will keep the editor supplied with short timely articles** of a thousand words or less and not over 1500 for the future numbers of the Journal. Much can be related in a thousand words by omitting useless details,

phrases and generalities. It can be justly said that many of the published agricultural articles today are too general and after reading over these lengthy articles the reader is often brought to realize that he has not found anything to supplement his store of knowledge. The progressive person cannot afford to spend his time reading such articles. In writing articles for the American Potato Journal kindly remember that our readers are seeking as much information as can possibly be obtained in a limited space of time. This point will be demonstrated in future numbers. The readers will welcome this change. The **goal is to give more informaton and render a greater service** than in the past and at the same time not to burden the readers with useless words.

ELECTION OF OFFICERS AT THE ANNUAL MEETING

The nominating committee made the recommendations below and the election was unanimous for all the following officers:

President, H. C. Moore, East Lansing, Michigan.
Vice-President, F. M. Harrington, Bozeman, Montana.
Secretary, Walter M. Peacock, Takoma Park, D. C.
Treasurer, E. V. Hardenburg, Ithaca, N. Y.
Editor & Bus. Mgr., Walter M. Peacock, Takoma Park, D. C.
Directors at large, — Daniel Dean, Nichols, N. Y. and E. L. Newdick, Augusta, Maine.

OFFICE EQUIPMENT FUND

This fund is slowly increasing and the day is coming when the chief organization of the potato industry of America will have essential office equipment. When Mr. L. L. Grant of Buckland, Conn. handed the editor $5.00 for this fund he remarked, "I've been going to send you this amount for some time but kept putting it off." How many others are putting it off? Those who are, kindly send it at your earliest convenience. The lack of necessary equipment is a big handicap which constantly slows up progress.

VERDICT IN FAVOR OF CERTIFIED SEED

The effort to protect legitimate interests of certified seed potato growers was upheld by a trial jury in the Lancaster District Court, Nebraska, before Judge Shepherd. This marks a new epoch in the certified seed industry. The Nebraska Farmer, an agricultural publication, renders a protective service to safe-guard the interests of its members. The verdict of the jury not only upholds this work but also endorses the work of the Nebraska Certified Potato

Growers Cooperative. It likewise construes to the seed potato trade the meaning of the word "certified" as applied to potatoes grown under proper certification methods.

Briefly the case may be stated as follows,—the C. C. Whitnack Produce Company brought suit of $35,000.00 against Sam R. McKelvie, editor of the Nebraska Farmer and the Nebraska Farmer for alleged libel in the publication of an article last spring exposing one Whitnack in selling so called certified seed potatoes under a tag similar to that used by the Nebraska Certified Potato Cooperative.

REVIEW OF RECENT LITERATURE

Effect of alfalfa and manure on potato yields.—*Montana Sta. Rpt. 1925, pp. 38, 39.*

Manure applied before planting the potatoes in a 2-year rotation of potatoes and oats at the Huntley, Mont., Branch Station resulted in 313 bu. of potatoes per acre compared with 197 bu. without manure, as an average of 12 years' cropping. In a 3-year rotation of oats, beets, and potatoes, the yield of potatoes was increased 45 bu. per acre as a result of applying manure to the beet crop, as compared with the same rotation without manure. In a rotation of potatoes, beets, and oats the acre yield of potatoes was 182 bu. However, when 3 years of alfalfa preceded these crops, making a 6-year rotation, the potato yield amounted to 291 bu. per acre. This was the average for 12 seasons.—**Henry M. Steece.**

Folsom, Donald, and Reiner Bonde.—Potato spraying and dusting experiments 1921 to 1925.—*Maine Agric. Exp. Sta. Bul. 334, pp. 205-284, August, 1926. (Issued in December).*

General reasons and standard methods are given for the spraying of potatoes. The results of tests in Maine to 1921 inclusive are tabulated and summarized, with references. They indicate that Bordeaux mixture would increase the yield about a fifth on the average. The tests reported in this bulletin for the first time are restricted to Aroostook County. In 1921 standard methods of spraying against aphids proved unsatisfactory. In the next four years a comparison of Bordeaux mixture and copper-lime dust gave an average increase of 8 bushels for spray and 7 bushels for dust over the 328 bushels yield of the check plots. Dust controlled early blight and flea beetles worse than spray, controlled late blight about as well, and depressed the yield less in the absence of diseases and pests. No effect of drifting dust was apparent. With equivalent amounts of metallic copper applied, dusting cost more (due to price of factory-mixed materials) and dusted copper adhered worse. For the 10-year period 1916 to 1925, the average increase in yield of Green Mountains in Bordeaux spraying tests

made on or near the Station experimental farm was 21 bushels or about 6 per cent over the check yield of 321 bushels. This smallness of increase in comparison with the increases reported from New York and Vermont is probably due to several conditions including absence of leafhoppers, lack of severity of early blight, and the earliness of autumnal killing frosts with a resultant lack of benefit from an extension of the life of the vines by copper stimulation. References are given to instances of yield depression by Bordeaux mixture in other regions. With enough moisture for late blight, the temperature may be too low for late blight injury, whereas in most regions a subnormal temperature is favorable to this disease. Causes of differences in the results of spraying are given, and methods of testing these results on any commercial farm are suggested. A method of detailing the costs of spraying and dusting is exemplified. A vine protector had a less significant effect than uncontrolled field conditions. The use of 5-50 copper sulphate solution to hasten maturing was valueless. — **Donald Folsom.**

GOLINSKA, J.—Potato varieties cultivated in Poland.—*Rocz. Nauk Rolnicz. i Lesnych, 14 (1925), No. 1, pp. 57-111, figs. 17; Fr. abs., pp. 77, 78.*

Forty-five potato varieties cultivated in Poland are described, important flower, germ, stalk, and tuber characters being arranged in comparative tables.—**Henry M. Steece.**

RUEBENBAUER, Z.—Influence of spacing on the yield and individual variability of potatoes (trans. title).—*Rocz. Nauk Rolnicz. i Lesnych. 15 (1926), No. 2 pp. 339-370; Ger. abs., pp. 368 370.*

The investigations reported on were concerned with the effects of spacings of 30 by 30 cm., 42.5 by 42.5, and 60 by 60 cm. on the yields, number and weight of tubers, starch yields, and starch content of the Silesia and Jubel potato varieties. Several correlations are indicated.—**Henry M. Steece.**

WALKER, J.—Can we predict the nature of the potato crop with any degree of accuracy.—*Sci. Agr., 7 (1926), No. 4, pp. 142, 143.*

The observations and results recorded in this contribution from the Dominion Experimental Farm at Indian Head, Sask., indicate that uniformity in size of plants, number and weight of tubers per hill, shape of tubers, and in other characters can be expected only if conditions of environment during growth are similar and relative uniformity exists among the seed pieces. This means careful selection of disease-free seed stock at harvest time, storage in conditions conducive to good keeping (cool and fairly dry) with no subsequent sprouting, efficient seed treatment before planting, the planting of uniformly prepared sets in uniformly prepared soil at equal depths, and similar cultivation given throughout the season.—**Henry M. Steece.**